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to instruct, and to speak throughout to the mind of the reader. And if important topics are not treated so fully as might be, and information in some respects is scanty, we must remember this collection of facts, notes of travel, and general observations, was made by the author while busily and devotedly engaged in a particular duty. Throughout, we perceive the experienced traveller, the practical philosopher, and the man of science, and our great regret is, that Dr. Seemann had not the opportunity and means of devoting himself to the critical examination of the ethnology and ethnography of the Fijian Islanders as he has of the botany of their islands. However, amid a good deal of confused information on these islands, it is refreshing to read a book like this, and feel, that its facts are reliable, its observations forcible, and its arguments to the point—that it is, in fact, a good authority on these islands, and one which the general and the scientific reader will peruse with both satisfaction and profit.

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## THE RELATION OF MAN TO THE INFERIOR FORMS OF ANIMAL LIFE.

By CHARLES S. WAKE, Esq., F.A.S.L.

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IMPORTANT as is the question of the relation between man and the lower animals, there can be no doubt that all inquiries as to the real nature of that relation have hitherto failed. Both materialists and spiritualists have been alike at fault. Neither of them has got beyond the mere external points of resemblance, the one of the body, the other of the mind; whereas the true question is, not in what do man and the lower animals agree, but in what do they differ so as to cause man's great superiority? The reason why the metaphysicians have thus failed is that, shackled as they have been by the prejudices of a too jealous theology, they have so framed the fundamental idea of their science, that the application of its truths to the subject of man's relation to the lower animals could not have any satisfactory result. On the other hand, the materialists, although their facts are abundant, have failed, because they have sought to deduce their theories from mere physical data, almost ignoring the influence of the spiritual powers in the phenomena of animal being and action. They have

been content to refer man's superiority to his possession of a greater capacity and finer texture of brain, combined with that of a refined organ of touch, forgetting that such superiority, with the higher nervous structure itself, may both be due merely to the operation of spiritual causes. Although Professor Huxley is by no means of this latter opinion, yet he may be quoted as an authority against any theory founded on mere structural differences between man and the lower animals; for he says "no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves." Whether *his* explanation of man's superiority is sufficient will be shortly seen.

Before endeavouring to ascertain by the application of the principles of psychology, the relation of man to the lower animals, it will be necessary to examine rather more fully the question of man's higher nervous structure. Of course it is impossible to *demonstrate* what influence over mental development the brain may have, or what ratio the development of the one bears to that of the other. It is quite evident, however, that the brain proper is not really essential to the exercise of mental power. If we take the invertebrata, creatures that have no brain, but merely one or more small nervous ganglia in its place, we see the exercise of great mental activity, and of a process of reasoning, simple though it may be in its nature. Comparing the actions of the invertebrata with those of the vertebrata, although we observe a marked advance in reasoning power, yet the increase is by no means proportioned to that of the nervous development as seen in the vertebrate brain. Judging from that fact, and from the small difference comparatively in the development of their respective brains, we should expect to see in man but little advance in mental development over the higher mammalia. It is not so, however. The superiority of man over the highest of the mammalia is far greater than that of any of the latter over the invertebrata. Nor is it merely an increase of intelligence. It is rather an enlargement of the mental powers, leading to the accumulation of stores of knowledge utterly unattainable by brute creatures, proving in man a mental development in some sense differing in kind as well as in degree.

Nor does the addition of a refined sense of touch account for man's superiority. As Sir Charles Bell has well said, "the hand corresponds to the superior mental capacities with which man is endowed. The instrument is capable of executing whatever his ingenuity suggests. Nevertheless, the possession of the ready implement is not the cause

of man's superiority, nor is its aptness for execution the measure of his attainments. So we rather say with Galen, that man has a hand, because he is the wisest of creatures, than ascribe to his possession of a hand his superiority of knowledge." It may be added that the argument just drawn from a comparison of the development of the brain in different animals, with the amount of intelligence seen in their actions, may be equally drawn from a comparison of that intelligence with the development of the organ of touch. Superior as is the human hand over that of the ape, that superiority is by no means equal to man's intellectual superiority over the most intelligent of the lower animals. As an instrument of communication with the outer world, and as a means of obtaining a true knowledge of form, size, and distance, man is perhaps as much indebted to the hand as to the eye; but without the mental faculty of combining their various sensations, the human hand would have no superiority in result over that of the ape.

Equally weak is the reasoning which ascribes brute inferiority to the want of the power of speech. True it is that language is the great instrument of man's progress in knowledge, but it is no less true that man's possession of the gift of speech can only be accounted for by the supposition that he is of a superior spiritual nature, language itself being the chief outward sign of such superiority. The lower animals themselves not only use certain sounds by which to express certain emotions, but they are able also to communicate their ideas to each other. In those sounds we have the rudiments of the speech of man, and they are as perfect for the use for which they are designed as are the operations of the mental powers which interpret them. The peculiar structure of the human organs of speech as little explains man's possession of a language, as does his superior brain development the greater development of his intellectual powers. Those organs are no doubt especially fitted in man for articulation, but many animals can produce sounds as articulate as those of man; and some birds can even speak with remarkable clearness and volubility. This shows convincingly that "the main difference lies in the internal faculty or propensity. . . . The perfect correspondence between the vocal instrument, and the laws governing the motions of the air is a contrivance, but that which prompts to the first efforts at articulation is in our intellectual nature."

In endeavouring to ascertain the true nature of the relationship between man and the lower animals, it will be necessary to treat of that relationship as of a twofold nature—that of the body, and that

of the soul, or whatever that principle may be in which reside the mental and emotional powers—as though the development of the powers of the soul is dependent, in the first place at least, on the body, they in reality exist independent of it. To show the analogy between the physical constitution of man and that of the lower animals, it will be sufficient to confine our attention to the development of the nervous system, as seen in the several organs of sense, that system being the portion of the bodily organism through which the inner principle of being holds intercourse with the outer world.

Considered as a nervous animal, man is seen to be allied to the lowest animated forms beneath him. The human being has five organs of special sense, but when we examine their operation we find that, however different may be the sensations transmitted by each, they may all be reduced to one single sense, that of touch or feeling. Smell and taste are dependent on touch, equally with seeing and hearing. In each case the impression is received by a sensitive surface, which is affected by contact with the operating medium, the difference between the sensations transmitted being caused by the structure of the organs themselves, rather than by any peculiarity in their operation. If we survey the animal kingdom we see the several organs of sense gradually losing their high and special development, until, when we reach the lowest form of animal life, no special organ of sense can be detected, and it is doubted even whether any nervous structure exists. Even, however, in the actions of the protozoa,—animals without the slightest trace of any bodily organisation,—we observe the operation of something like sensation, revealing the presence of a general sense of touch. This is the very simplest form of nervous development (if that term may be applied to it), and of course it is not pretended that there is any knowledge on the part of the protozoa of the sensation. It is wholly instinctive, and that because the operation is not of a special organ of sense, but merely that of the general nervous sensitiveness which underlies all the special media of sensation.

It is not until a nervous system can be distinctly traced that we find the development of a special organ of sense. When it shows itself, however, it is seen to be one of those that man also possesses. And it is important to our argument to observe that the sensational organs of the lower animals, when they *are* developed, are always essentially the same as those of man. He has in their perfection all the organs of sense possessed by any of the creatures below him. Passing through the radiata, the mollusca, and the articulata, we

reach the vertebrata, in which the organs of sense are more perfectly developed than in any other of the lower animals. Among the vertebrata we may accept the ape as the nearest approach to man in bodily structure, and we find that the special nervous developments are the same in both, the only apparent difference being in the superior fineness of the organ of touch in man, he being the only animal that possesses such an organ in the form of a true and distinct hand, used only as an organ of touch. That fact is significant, as showing the special development of the general underlying nervous sensitiveness, and, as such, being the most important of all the special nervous developments.

The organs of sense being thus alike in man and in the lower animals, the sensations which are the result of the operation of those organs, must also have a resemblance. Light affects the eye of the eagle in the same way as it affects that of man, and the same sensation will in each case be impressed on the brain. And not only so, but that sensation will be interpreted in the same way in both cases. The object from which the light which gives rise to that sensation is transmitted will have the same appearance to each. Nor can we doubt its being so, when we watch brute actions, and compare them with those of man under like circumstances.

We have now reached the second point of relation between man and the lower animals, and we are met on the threshold of inquiry by the important question—to the operation of what principle are the actions of the lower animals to be referred? Are they phenomena accompanying a peculiar state or development of a material organisation merely; or must they be ascribed to the operation of a spiritual principle, independent for its being of material organisation? We, perhaps, know too little of the true nature of matter to judge whether in its ultimate essence it may not be capable of thought or will. The intimate union between the body and soul of man points to a very near approach, if not in essence, at least in mode of being, of matter to mind. Until, however, we know more of the nature of the material essence, we are justified in asserting that matter cannot think or will.

The actions of many of the lower animals so closely resemble those of man, in their motives and object, that it is usual, as we have seen, to refer brute inferiority to the restricted development of the mental powers, consequent on some difference in nervous structure, or on the want of the power of speech, without supposing any actual inferiority of mental nature. None can doubt that brute

action is very often governed by observation, and by reasoning on the result of such observation. If that be so, it proves the exercise of the mental process (call it thought or intuition), from which judgment flows, and of the will which gives effect to the determinations of the reason. Nor can we deny to the lower animals the attributes of bodily sensibility and mental emotion. This sameness between the spiritual powers of man and the lower animals must be remembered. For if the actions and emotions of the latter are merely the result of the activity of the forces of a material organism, so must those of the former be also. Superior as the result of the operation of the mental powers may be in the case of man, if those powers operate alike in both, they must inhere in the same principle, spiritual or material. If, however, brute action is not the mere result of bodily organisation it must depend on the activity of a spiritual principle; and it is asked what is that principle? If we examine man's internal or mental actions we see that they may be classified as those of emotion, thought, and will, none of which we ever think of referring to the body alone. It is the spiritual principle of being we call the soul, the very man himself, which thinks, and which shows the result of its thought in the physical actions that flow from the determination of the will. If it be so, can we deny to the lower animals the possession of the soul? Even if the exercise of thought could be imagined to be the operation of a cunningly devised material mechanism, no mere machine could give the light which sparkles in the eye of the affectionate dog, or prompt the care of the sagacious elephant.

If the lower animals have a certain spiritual principle, which we call the soul, as part of their being, man, as a being of like emotions, thought, and mental action, must have the same spiritual principle, the possession of which is the second point of relation between them. It will perhaps be objected, that man may have a principle of being which acts in the same way as that possessed by the lower animals without its being the same in essence—that indeed the brutes have what has been called the animal soul which dies with the body, but that man has a spirit possessing all the powers of the soul in a superior degree, and in a fuller development, and which is immortal.

It is not for us to say that there *cannot* be two distinct kinds of spiritual essence which, though different, have yet the same powers and attributes, the only distinction between them being that those powers are more fully developed in the one than in the other. It does, however, seem to be improbable. The soul is made up of cer-

tain powers or attributes which alone give it existence, and the operation of which is alone the sign of spiritual life. Wherever, then, those powers exist, there also is the soul as the principle of being in which they inhere, and any inferiority of soul action in any particular case must depend, not on actual inferiority of spiritual nature, but either on some inferiority of bodily structure which hinders the development of the soul's powers, or on the absence altogether of some aid to that development. That man's intellectual superiority depends on superiority of bodily structure merely we think few people will now affirm. The structural difference between man and the ape is, indeed, comparatively slight; yet we see in the one case that intelligence is limited in its exercise to the satisfaction of certain wants, and soon reaches a point beyond which it can be developed no further; whilst, on the other, mental exercise is not bounded by any bodily, or even spiritual, want, the capacity for knowledge increasing with every addition made to it.

The true explanation of the inferiority of the lower animals is, that their mental powers, though not imperfect, either in their constitution, development, or operation, and though containing in themselves the germ of all truth, are yet limited in their very nature, and incapable, without the assistance of a higher principle, of reaching beyond a certain range of knowledge. The soul is essentially instinctive; but, superadded to instinct, it possesses the power of storing up its sensational experiences, of recalling them by memory, and of reasoning from them and forming judgments as to their relations. It is observable, however, that although brute reason enables its subjects to reason from past experience as to the proper conduct under particular circumstances, it never enables them to get further. The lower animals have no power of abstraction or generalization, in the proper signification of those words. They do, indeed, sometimes act as though they exercise such a power, but they do not in reality; the appearance of it arising from the intimate connection which always continues in the brute mind between instinct and reason. However perfect may be their reasoning about particulars, it never leads them to the knowledge of general truths, nor even to the remembrance of particular ones, except so far only as they may be influential over present action.

Referring now to the mental actions of man, it may be stated as an infallible formula that, if we add to the results of the mental actions of the lower animals the operation of the principle of reflection, we shall have, as the result, the perfected knowledge of man. If that be



so, the true explanation of the difference between human and brute mental development is to be found, not in any difference in capability of development, but in the fact of the operation of the mental powers being enlarged in man by the addition of a spiritual principle which the lower animals have not. The origin of all mental action is to be traced to certain intuitions which reside in, and may be said to be the life of, the soul. It is their working which is seen in instinct, and to dependence on them the operation of the simple reason of the lower animals owes all its perfection. Those intuitions are all-powerful in brute action; indeed, so much so, that, while they are the great living principles of action, the animal may be said to be merely the instrument by which they work. In man those intuitions are equally influential, and he is, up to a certain period of his life, equally their instrument. As man gains experience, however, he loses his dependence on the intuitions of instinct for the guidance of his conduct, and with the exercise of reflection he gradually arrives at the knowledge of certain principles of truth, on which are founded all the superstructures of his philosophy. But those principles of truth are in reality nothing but the very intuitions which had in infancy guided his hand, now made his own, and become the instruments by which he works for the extension of his knowledge.

We see, then, in man two spiritual principles; one in which the principles or intuitions of truth reside, and the other that which searches out those principles and makes them its own. The first, that which the lower animals possess equally with man, and which is the seat of the will, is the *soul*. The second, that which man alone possesses, is the *spirit*—the seat of that reflection, or higher reason, to the operation of which on the sensations conveyed through the several sensuous organs man's physical science is owing. There are two objections to this theory of a dual spiritual nature, which I must shortly consider. The first, the philological one, is plausible, but, in reality, of no force. It is that the two words, "soul" and "spirit" (the only two names which can be used to denote the two spiritual principles I have named) are both of the same meaning, literally denoting "air" or "breath". It has been said that "soul is coincident with *halitus*, breath, derived from *halare*, to breathe, a root familiar in the words *exhale*, *inhale*, and itself only an enlarged form of the earlier word *aëō* or *áo*, a beautiful onomatopœia, expressive in its long, open, vowels of the very act which it designates"; and that "spirit takes us to the very origin of words, resting on the beautiful lisp or whisper with which the breezes quiver the leaves." That may

be quite true; but it is a remarkable fact that in most languages, and probably in all the older ones, there *are* two such words, having the same ultimate meaning, and yet used as though intended to express different ideas.

As little conclusive is the objection that we cannot imagine more than one kind of spiritual essence, and that, therefore, the idea of a dual spiritual nature in man cannot be true. Such belief is the result, not of reasoning, but of mere prejudice, which, if contrary to fact, must be got rid of as quickly as possible. We know nothing of spirit in its essence, nor what may be the modes of its development. If, therefore, we find certain facts, which cannot be explained without the supposition of there being more than one of such modes, or even spiritual essences, we are bound to receive that supposition as a fact, throwing on one side all our prejudices, whether they are connected with religious belief, or arise from defective scientific education.

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## THE PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.\*

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THE two last *livraisons* of the *Bulletins* of the Anthropological Society of Paris are now before us, and are fully equal in scientific interest to any of the previous publications which have emanated from the same source. The lucid and comprehensive exposition of the past labours of the Paris Society, with which M. Broca favoured us, and which was published in the last number of the *Anthropological Review*, has placed our readers entirely *au courant* with the past labours of the French Society; and it will be the future task of the editors of the *Anthropological Review* to give periodical abstracts of the summarized conclusions which are arrived at in the Quarterly Bulletins of the Paris Society.

Enjoying the high privileges of the presidency in 1863 of M. de Quatrefages, with M. Gratiolet as vice-president, M. Broca as general secretary, and MM. Trélat and Dally as annual secretaries, the Society is as efficiently represented as it was during the years when the

\* *Bulletins de la Société d'Anthropologie de Paris*. Vol. iv. First and Second Fasciculus—January to May, 1863.